

# THE MINERAL INDUSTRIES OF ASIA AND THE PACIFIC

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The Asia and the Pacific region, which includes 31 countries and territories, has a total area of about 29.9 million square kilometers. The total population in 2004 was about 3.55 billion, which accounted for about 56% of the world total. China and India, which were the world's two most populous countries, accounted for 67% of the region's total population and about 37% of the world's total population. China's and Japan's economies ranked in the top five in the world. The economies of China, India, and Mongolia were the fastest growing in the region in 2004 (tables 1, 2).

Australia and China were among the world's leading mineral producers. Australia has large resources of bauxite, coal, cobalt, copper, diamond, gold, iron ore, lead, lithium, manganese, mineral sands, nickel, silver, tantalum, uranium, and zinc. China has large resources of antimony, arsenic, barite, coal, copper, fluorite, gold, graphite, iron ore, magnesium, mineral sands, rare earths, silver, strontium, tin, tungsten, and zinc. India also was one of the world's significant mineral producers and has large resources of barite, bauxite, chromium, iron ore, manganese, rare earths, and salt. Other significant mineral producers in the region were Indonesia, which has large resources of coal, copper, gold, nickel, and tin; Mongolia, which has large resources of copper, fluorspar, and molybdenum; Papua New Guinea, which has large resources of copper and gold; the Philippines, which has large resources of copper, gold and nickel; and Thailand, which has large resources of feldspar, gypsum, and potash.

Despite the large amount and wide variety of regional resources of nonfuel minerals and mineral fuels in Australia, China, India, Indonesia, Mongolia, Papua New Guinea, the Philippines, and Thailand, the regional supplies of numerous nonfuel minerals [including aluminum, bauxite, copper, gold, diamond, iron ore, lead, platinum-group metals (PGM), phosphate rock, silver, and zinc] and such major mineral fuels as coal, natural gas, crude petroleum, and refined petroleum products were insufficient to satisfy the demand in the region. The situation was caused largely by a substantial increase in consumption of nonfuel minerals and mineral fuels by China and India; by such resource-poor industrialized countries as Japan, Hong Kong, the Republic of Korea, Singapore, and Taiwan; and by the growing economies of such middle-income developing countries as Indonesia, Malaysia, and Thailand. The Middle Eastern and North American regions supplied a large percentage of the Asia and the Pacific region's requirements for natural gas, crude petroleum, and refined petroleum products. Africa, North America, and South America supplied a substantial percentage of the region's raw material requirements for ferrous and nonferrous metals.

China and Japan were the two major regional markets for crude and processed minerals. Japan was the region's leading consumer of ferrous and nonferrous metals because of its large manufacturing sector and its poor indigenous resources. China, however, remained the region's strongest consumer in terms of growth in demand, especially for such mineral commodities as aluminum, cement, coal, copper, iron and steel, lead, natural gas, crude petroleum, tin, and zinc. India, Indonesia, the Republic of Korea, Malaysia, Singapore, Taiwan, Thailand, and Vietnam also were important consumers of such mineral commodities as aluminum, cement, copper, gold, iron ore, lead, phosphate rock, silver, steel, and zinc.

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- Malaysia—Ministry of Primary Industry, Minerals and Geoscience Department;
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For key economic data:

- Asian Development Bank in Manila, the Philippines;
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- The World Bank in Washington, DC.

For exploration and other mineral-related information:

- Australian Bureau of Statistics in Canberra, Australia; and
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## General Economic Conditions

Despite the adverse affects of higher energy prices, the economies of the Asia and the Pacific region remained strong. The region's aggregate real gross domestic product (GDP) expanded by about 7% in 2004. Except for the Pacific developing countries, nearly all developing Asian countries posted more than 5% in the growth GDP. The growth of economies of the region benefited from the robust growth in major industrial countries, especially the United States. Revival of business investment was the main engine for economic growth in the region, particularly in East Asia and Southeast Asia where, except in China, it had been lagging since the Asian financial crisis in 1997; in China, investment remained high during the past decade. Of the 31 countries and territories in the region, Japan ranked the richest in terms of its per capita GDP, and East Timor was the poorest. China ranked as the region's largest economy in terms of total GDP based on purchasing power parity followed by Japan, India, the Republic of Korea, Indonesia, and Australia (table 2).

The economies of the developing Asian countries were expected to continue to perform better than the developed and newly industrialized Asian countries. The economic growth in the Asia and the Pacific region was expected to be higher than in other regions in the world. According to the Asian Development Bank, the economic growth in the Asia and the Pacific region was projected to be between 6.5% and 6.9% (7.1% and 7.5% on the basis of purchasing power parity). The economic growth of East Asia was projected to be between 6.7% and 7.2% for the next several years, which was the fastest within the region. The Pacific area was project to be the slowest, with a projected growth rate of between 1.4% and 2.3% (Asian Development Bank, 2005, p. 4). Japan is the world's second largest economy behind the United States. Japan's economy had recovered completely and domestic demand grew solidly in 2004. An improving Japanese economy could create more investment opportunities domestically and would likely benefit China, Indonesia, the Republic of Korea, Taiwan, and Thailand, which export their products to Japan. Japan has been a key investor in many countries in Asia. The Japan's shares of investment, which accounted for 30% of Thailand's the total foreign direct investment; 25%, the Philippines, and 16%, the Republic of Korea,.

Despite the tightened policies introduced in 2004, China's economy was expected to continue to grow at annual rate of about 8% until 2010. Consumption was picking up slowly but steadily, and investment was concentrated more in sectors with bottleneck problems, such as energy and transportation infrastructure, during the year. South Asia's economic growth was projected to be about 6% per year. India's economic growth was projected to grow at an average of 7% per year into 2007; the industry and service sectors were expected to be the main engines for this growth. The Indian Government planned to increase funding for infrastructure investment, but this increase may be constrained by large budget deficits on the part of the Federal and State Governments (Citigroup Global Market Inc., 2005, p. 60).

## Investment Interest and Political Risk

China continued to invest heavily in expanding its mineral industry's production capacity, especially of aluminum, cement, copper, and iron and steel. To prevent duplicate investment and nonperforming loan problems and to maintain China's financial stability, the Ministry of Land and Resources froze the supply of land for building villas, and the Chinese Central Bank raised the required reserves ratio on commercial banks to 7% from 6%. The Government issued a circular to commercial banks to curb credit and expansion investment projects related to the aluminum, cement, and iron and steel sectors. The State Council raised the lending criteria for aluminum, cement, and steel projects by requiring more equity investment.

In 2004, investment in Mongolia was focused mainly on copper and gold. The privately owned Ivanhoe Mines Ltd. of Canada and the state-owned China International Trust & Investment Corp. of China agreed to form a strategic alliance (joint venture) for mineral exploration, development, and production projects. In 2004, Ivanhoe completed the feasibility study for the development of two gold-rich open pit copper mines at Oyu Tolgoi in Umnogovi Aimag in the southern Gobi area. The initial capital investment of about \$530 million would be spent for the first stage of the project during which between 300,000 and 400,000 metric tons per year (t/yr) of copper concentrates and 12.5 t/yr of gold would be produced.

The Indian Government changed its investment policy to allow private sector participation in exploration and exploitation of the mineral sector. The policy changes attracted multinational companies to participate in exploration for base metals and other minerals. As of December 2004, 73 foreign investment projects worth \$900 million were submitted for Government approval. The Government also abolished limits on private oil exploration and marketing companies.

In the Republic of Korea, Pohang Iron and Steel Co. Ltd. signed a contract with Voest-Alpine Industrieanlagenbau of Austria to build a \$44 million FINEX plant at the Pohang site. FINEX is an environmentally friendly ironmaking technology. FINEX simplifies the ironmaking process by direct application of fine iron ore. The first commercial-scale FINEX ironmaking plant in the Republic of Korea was scheduled to begin operations by the end of 2006.

In Burma, China Nonferrous Metal Mining and Construction Co. Ltd. and Burma's Mining Enterprise No. 3 signed an agreement for mineral exploration in northern Thabeikkyin Township in Burma, which is located about 130 kilometers from the southeastern border of Yunnan Province (China). In Malaysia, Cahya Mata Sarwak Bhd of Malaysia and China's China Hydro Corp. and Shandong Luneng Group signed a memorandum of understanding to jointly build a 500,000-t/yr aluminum smelter in Sarawak. In Laos, Oxiana Ltd. of Australia invested \$330 million and Pan Australian Resources N.L. of Australia invested \$165 million for exploration and development of copper and gold projects in Laos. In Vietnam, Tiberon Minerals Ltd. of Canada was expected to invest about \$140 million during the next 2 to 3 years for the development of a tungsten-fluorite mine at the Nui Phao deposit.

## Legislation

To attract foreign investment in mineral development and production in China, the Government urged the National People's Congress to amend the mineral resources law, which had been enacted in 1986 and amended previously in 1996. Under this law, prospectors have mining rights, but how such rights can be guaranteed is not explained clearly. In 2003, the Ministry of Land and Resources established a mineral resources law consultant committee to seek recommendations from domestic and overseas mining law experts on the proposed redefinition of mineral rights.

In India, the Government reduced the basic tariff on imported metallurgical coke to 5% from 15% and abolished the tariff on metallurgical coke imported from China. The Government also reduced import tariffs on polished diamond and gemstones to 5% from 15% and reduced the custom duty on gold bars and coins to \$2.10 per 10 grams in 2003 from \$5.25 per 10 grams in 2002. In the Republic of Korea, the Government had reduced the import tariff on such raw materials as coal and ore and concentrates of copper, iron, lead, manganese, titanium, and zinc and on such processed minerals as primary aluminum, refined copper, nickel oxide, and pig iron.

In Indonesia, the drafting of a proposed new mining law was completed by the Ministry of Energy and Resources (MER) and submitted to the State Secretariat for approval before submission to the House of Representatives to be legislated into law. The new mining law would replace General Mining Law No. 11/1967. The replacement was considered to be necessary because the old law was not compatible with conditions in the mining sector.

In Mongolia, the Parliament had approved amendments to the Law of Corporate Income Tax. The corporate income tax ceiling under the amendment was to be reduced to 30% from 40% effective January 1, 2004. Various tax incentives for foreign investment companies, however, would be terminated. The Government submitted a proposed amendment to the Parliament in December 2003 that would abolish the 10% value-added tax on gold sales and change the royalty for extraction of hard-rock mineral deposits to 2.5%, and of placer gold deposits, to 7.5%. In Sri Lanka, the Parliament approved the Petroleum Resources Bill, which allows the private sector to invest in oil and gas exploration to exploit the country's petroleum resources and to share profits with foreign and local companies.

## Exploration

Exploration activity in much of the Asia and the Pacific region increased in 2004 from the 2003 levels. Data derived from the Metals Economics Group (MEG) annual survey suggest that the 2004 proposed budget allocations for Australian exploration activity of about \$522 million was 54% higher than the \$339 million reported by MEG in its 2003 survey. Similarly, the 2004 budget for the Pacific region countries (excluding Australia) of about \$156 million was about 68% higher than the corresponding 2003 budget. The estimate for the exploration budget for mainland Asia was reported to be \$204 million in 2004 by MEG, which was up by about 140% from the \$84 million reported for 2003 (Metals Economics Group, 2004a, b).

Although the MEG estimates of recent Australian mineral exploration activity showed an increase in 2004, Australian activity has generally declined since 1997. The MEG estimate for the 2004 Australian exploration budget allocation declined to 14.7% of the total world exploration budget in 2004 from 15.5% in 2003 and 17.6% in 2002. The Australian Bureau of Agricultural and Resource Economics (ABARE) reported minerals exploration expenditures for the fiscal 2004-05 year to be \$1.40 billion, as compiled by the Australian Bureau of Statistics; the exploration expenditure on petroleum was \$735 billion; gold; \$274 million; base metals, \$183 million; and others, \$208 million (Australian Bureau of Agricultural and Resource Economics, 2005).

The Australian states and territories that experienced the highest levels of exploration activity in 2004 were, in descending order based on the number of sites, Western Australia (57%), South Australia (12%), Queensland, (10%), and New South Wales (10%). South Australia saw gains in 2004 as a result of extensive work conducted on the Prominent Hill copper/gold project. Several Western Australian projects increased their identified resources as a result of drilling programs conducted in 2004.

The Australian Government issued a report in 2004 that outlined its strategy to stimulate mineral exploration in Australia. The report titled "the Road to Discovery: the Minerals Exploration Action Agenda," discusses measures planned to address impediments to resource exploration, including issues related to the labor pool, land access, minerals data availability and quality, and native title issues (Mining Journal, 2004a). The Minerals Council of Australia released an update to the public reporting standards contained in the Australian Code for Reporting of Exploration Results, Mineral Resources, and Ore Reserves (Mining Journal, 2004b).

Native title claims issues continue to affect Australian exploration and mining. A series of templates for native title agreements was developed by the Victoria Minerals and Energy Council as a means of simplifying the native title process (MineBox, 2004b§<sup>1</sup>). Agreements among the Western Australia Government, the mining industry, and native title claimants were signed in 2004 to speed up the native title process by establishing a mutually-agreed-upon heritage-protection process (MineBox, 2004c§). An \$8.8 million 4-year program of airborne geophysical surveys was implemented in Western Australia during 2004 (MineBox, 2004d§).

Based on MEG data, the 2004 exploration budget allocation for the Pacific region and Southeast Asia was about \$156 million, which was up in dollar terms from the 2003 level of \$93 million and up to 4.4% of the world exploration budget compared with the 4.2% share reported for 2003. Growth in this region remained somewhat muted amidst uncertainty of tenure and continued political and social unrest (Metals Economics Group, 2004b). A significant portion of the interest was focused on later-stage projects, which accounted for about 39% of all exploration, based on the U.S. Geological Survey site information. Projects that received significant activity included expansion of copper-gold reserves in the Grasberg area (Indonesia), drilling at Penjom (Malaysia), extension of the Fraser zone at Macres (New Zealand), and feasibility work at the Ban Phuc base metals-deposit in Vietnam.

<sup>1</sup>References that include a section mark (§) are found in the Internet References Cited section.

The Indonesian Government issued a regulatory decree that allows 13 mining companies that have previously reported economically viable mineral reserves to resume exploration or mining activities in protected forested areas. This regulation does not replace a 1999 law that banned mining in protected forests, so any future mineral exploration not specifically covered in this decree would continue to be prohibited (Mineweb, 2004§). The Supreme Court of the Republic of the Philippines revoked the country's system of financial or technical assistance agreements that were designed to allow full foreign ownership in mining projects with a capital cost of more than \$50 million (Mining Journal, 2004d).

Within mainland Asia, base-metals and gold exploration was focused on China and Mongolia in 2004. These two countries combined accounted for about 91% of mineral exploration within the region. MEG estimates suggest that about \$100 million was budgeted for Mongolia in 2004, which was up from the \$25 million budgeted in 2003; similarly, MEG estimated that the 2004 mineral exploration in China was about \$86 million, which was up from \$21 million in 2003 (Cox and Goulden, 2005§).

Mineral exploration in China has increased since the country opened its mining sector to foreign investment during the 1990s. The gold sector in China is being restructured to separate operational functions of the Government from regulatory functions. Technological improvements in the Chinese gold mining industry, regulations encouraging foreign investment, and the establishment of publicly-listed gold companies are making it easier for both Chinese and foreign companies to conduct business in China. A total of 2,693 exploration and mining licenses were issued between January and June 2003 compared with 1,794 exploration licenses in 2002 (Anser Enterprises Corporation, 2005).

China continued to reform its mining sector. The China State Council released a white paper in December 2003 that summarized its plans and progress toward updating its mining regulatory regime. A revision of the Mineral Resources Law was being prepared and was expected to be adopted within 4 to 5 years (Kwauk, 2004). In India, the Confederation of Indian Industry's Eastern region commissioned a 3-year study to assess the mineral potential of the region (Mining Journal, 2004c).

Interest in mineral exploration in Mongolia in 2004 was in large part driven by the exploration activity of Ivanhoe Mines Limited at its Turquoise Hill (Oyu Tolgai) copper-gold project. MEG reports that the company allocated \$78 million for exploration projects in Mongolia, which accounted for 79% of the MEG estimate for total 2004 mineral exploration expenditures for Mongolia (Metals Economics Group, 2004b). Interest in exploring other countries of South Asia, notably India and Pakistan, has also increased.

## Commodity Overview

Estimates for production of major mineral commodities for 2007 and beyond have been based upon supply-side assumptions, such as announced plans for increased production/new capacity construction and bankable feasibility studies. The outlook tables in this summary chapter show historic and projected production trends; therefore, no indication is made about whether the data are estimated or reported and revisions are not identified. Data on individual mineral commodities in tables in the individual country chapters are labeled to indicate estimates and revisions. The outlook segments of the mineral commodity tables are based on projected trends that could affect current (2004) producing facilities and on planned new facilities that operating companies, consortia, or Governments have projected to come online within indicated timeframes. Forward-looking information, which includes estimates of future production, exploration and mine development, cost of capital projects, and timing of the start of operations, are subject to a variety of risks and uncertainties that could cause actual events or results to differ significantly from expected outcomes. Projects listed in the following section are presented as an indication of industry plans and are not a USGS prediction of what will occur.

## Metals

**Aluminum and Bauxite and Alumina.**—The region's production of bauxite accounted for about 49% of the world total in 2004. Australia, which was the world's leading producer of bauxite, accounted for 30% of the world total; it was followed by China, 10%, and India, 8%. Production of aluminum accounted for about 33% of the world total in 2004. China, which was the world's leading producer of aluminum, accounted for about 20% of the world total; it was followed by Australia, 6%, Japan, 3%; and India, 2% (table 4).

Regional production of primary aluminum and bauxite was expected to continue to grow at an average annual rate of about 8% and 8%, respectively, between 2004 and 2011 (tables 5, 6). This prediction was based on reported capacity expansions in Australia, China, India, and Vietnam. Regional production of secondary aluminum was predicted to increase to 1.6 million metric tons per year (Mt/yr) in 2011 with a slight decrease in estimated production in Japan and a gradual increase in estimated production in China (table 7).

In Australia, alumina capacity expansions included the construction of a 1.4-Mt/yr refinery by Comalco Ltd. at Gladstone, Queensland; a 600,000-metric-ton-per year (t/yr) refinery at Pinjarra; and a 250,000-t/yr refinery at Worsley. In China, several companies either began or planned construction of alumina refineries in the Provinces of Guangxi, Henan, Shandong, and Shanxi. Aluminum Corporation of China Co. Ltd. (Chalco), the Xinzhou City Government, and the Luneng Group formed a joint venture, Luneng Jinbei Aluminum Industry Co. Ltd., to build a 2-Mt/yr refinery. Chalco, Bosai Aluminum Co., and others jointly built an 800,000-t/yr refinery in Chongqing City. The East Hope Group's 1.05-Mt/yr refinery was under construction in Minchi, Henan Province. Xinan Aluminum Co.'s 800,000-t/yr refinery at Xinan, Henan Province, was scheduled to be commissioned in 2005. Baofeng Aluminum Co. and Shenhua Group planned to build a 1.05-Mt/yr refinery at Baofeng, Henan. The Shandong Nanshan Group planned to build a 1-Mt/yr refinery at Longkou, Shandong Province. In the State of Orissa in India, capacity expansions included the ongoing expansions of a bauxite mine and an alumina refinery to 4.8 Mt/yr and 1.6 Mt/yr, respectively, at Dhamanjodi; an aluminum smelter to 525,000 t/yr at Angul by National Aluminium Co. Ltd.; and an aluminum smelter to 57,200 t/yr from 30,000

t/yr by Indian Aluminium Co. Ltd. at Hirakud. Vedanta Resources plc started construction of a 1.4-Mt/yr refinery and was scheduled to complete it in 2007; the company was also considering building an aluminum smelter in Orissa.

**Copper.**—The region's production of mined copper accounted for about 17% of the world total in 2004. Indonesia, which was the leading regional producer, was followed by Australia and China. Production of primary refined copper metal accounted for about 31% of the world total primary refined copper production in 2004. Among the region's refined copper producers, China was the world's second ranked producer of primary and secondary refined copper metal, and Japan ranked third. Australia and the Republic of Korea also were important producers of refined copper metal in the world (table 4).

Japan was one of the world's major import markets for copper concentrates. The country imported more than 4 Mt of copper concentrates annually. China was also a major importer of copper concentrates and refined copper. China imported about 2.9 Mt of copper concentrates and about 1.4 Mt of refined copper. China and Japan accounted for about 50% of copper concentrates traded in the world. Other important consumers of copper concentrates in the region were India and the Republic of Korea, which imported about 1.3 Mt of copper concentrates each. Australia, Indonesia, Mongolia, and Papua New Guinea were the major regional suppliers of copper concentrates to China, Japan, and the Republic of Korea. Japan, Indonesia, and the Philippines were the region's major suppliers of refined copper to China and other Southeast Asian countries.

Between 2004 and 2011, regional production of refined copper metal and mined copper was expected to continue to increase at an average annual rate of about 6% and 7%, respectively. This prediction was based on reported capacity expansions of mined copper in Australia and Indonesia, as well as Burma, Laos, Thailand, and Vietnam, and on reported capacity expansions of refined copper metal in China and Japan, as well as Burma, Laos, Thailand, and Vietnam (tables 8, 9).

In Australia, mine production was expected to increase because of higher output from the Tritton copper mine, which is owned by Tritton Resources, and Telfer gold/copper mine, which is owned by Newcrest Mining Ltd. In Indonesia, gradual capacity expansions were to be undertaken by P.T. Freeport Indonesia Co. at Grasberg, Province of Papua, and by P.T. Newmont Nusa Tenggara at Batu Hijau on Sunbawa Island, Province of West Nusa Tenggara. In China, Jiangxi Copper Co. Ltd. planned to expand the mining and processing output capacity at the Wujiauwu, the Wushan, and the Yinshan Mines. For refined copper, China's Jiangxi Copper planned to increase its refining capacity to 700,000 t/yr in 2007 from 400,000 t/yr in 2004 at Guixi, Province of Jiangxi, and Yunnan Copper Group Co. Ltd. planned to increase its refinery capacity to 350,000 t/yr from 160,000 t/yr at Kunming, Province of Yunnan, by 2005. Tongling Nonferrous Metals Co. planned to expand its copper refining capacity to 450,000 t/yr from 310,000 t/yr in the next 3 years. In Japan, Sumitomo Metal Mining Co. Ltd. planned to gradually expand the capacity of its Toyo Smelter and Refinery to 450,000 t/yr by 2008. In Burma, Myanmar Ivanhoe Copper Co. Ltd. planned to develop the Letpadaung deposit in the Monywa area and to increase its capacity to 125,500 t/yr of copper cathodes from 25,000 t/yr in five stages between 2005 and 2009. In Laos, Oxiana Ltd. of Australia planned to develop a copper mine and to build a processing plant at the Khanong deposit to produce 60,000 t/yr of copper cathodes by 2006. In Thailand, Pan Australian Resources N.L. of Australia, in joint venture with Padaeng Industry Public Co. of Thailand, planned to develop a copper mine and to build a processing plant at their PUT 1 deposit, which could begin operations at the capacity of 30,000 t/yr of copper cathodes by 2008. Thai Copper Industries PLC planned to commission its new 165,000-t/yr copper smelter and refinery in Rayong by mid-2004. In Vietnam, Vietnam National Minerals Corp. began construction work on a copper mine and smelter at Sin Queyen, Province of Lao Cai, to produce 42,000 t/yr of copper concentrate and 10,500 t/yr of refined copper by 2006.

**Gold.**—The region's production of mined gold accounted for about 30% of the world total in 2004. Australia was the leading mined-gold-producing country in the region, followed by China and Indonesia. The region's production of mined gold increased by 68% between 1990 and 2000 and decreased slightly by about 0.5% between 2000 and 2004 mainly because of the decline in output from Australia, Indonesia, and Papua New Guinea (table 10).

Australian gold production was expected to grow only slightly in the next few years. The output of a number of Australia's large gold mine operations, such as AngloGold Ashanti's Sunrise Dam, Goldfield's St. Ives, and Newmont's Kalgoorlie and Tanami, was forecast to decline because of low ore grades. The decline of these operations was offset by the planned opening of a number of operations such as Ballarat Goldfields' Ballarat East in Victoria, and BMA Gold's Twin Hills and Citigold's Warrior in Queensland, which were expected to begin operation within the next couple of years. In 2004, China's production of mined gold reached a record high of more than 200 metric tons (t); that of Indonesia declined because of low ore grade from Freeport's Grasberg mine, although production was expected to rebound in the next several years. Owing to development of the Boroo mine, Mongolia's production of mined gold increased sharply. Production of mined gold in Japan, New Zealand, Papua New Guinea, and the Philippines remained steady in 2004. Laos expanded its mined gold operation at Sepon, Province of Savannakhet, to 2.5 Mt/yr from 1.25 Mt/yr in 2004.

The Asia and the Pacific region was the world's major market for gold. India was the world's leading consumer of gold. The continuous strong economic growth and rising urban incomes led to higher demand for gold jewelry in China in the next decade. Gold demand in other countries in the region was expected to remain steady in the future.

Regional production of mined gold was expected to continue to increase at an average annual rate of 5% between 2004 and 2011. This prediction was based on gradual capacity expansions mainly at the major copper and gold mines in Australia, China, Indonesia, and Mongolia. Production of mined gold in Japan, Laos, New Zealand, Papua New Guinea, the Philippines, and Thailand was predicted to hold steady from 2004 to 2007 and to increase slightly with gradual capacity expansions of gold and copper mines between 2007 and 2011 (table 10).

**Iron and Steel.**—The region's production of iron ore was estimated to account for, in terms of metal content, about 40% of the world total in 2004. Australia ranked second in the world as a producer of iron ore; it was followed by China and India. The region's production of pig iron and direct-reduced iron (DRI) was estimated to account for about 57% of the world total. China, which ranked as the world's leading producer of pig iron, accounted for 35% of the world total; it was followed by Japan, which accounted for 11%. The region's production of crude steel was estimated to account for about 49% of the world total. China, which was by far the world's

leading producer of crude steel, accounted for about 26% of the world total. Its crude steel output was slightly less than the combined total production of Japan, the United States, and Russia, which ranked second, third, and fourth, respectively (table 4).

East Asian countries were the world's leading consumers and importers of iron ore and accounted for about two-thirds of the world's total iron ore seaborne. Australia was Asia and the Pacific region's and the world's leading supplier of iron ore. During the past 2 years, India's iron ore output increased sharply to meet domestic and the regional demand. India replaced Brazil as China's second ranked iron ore supplier after Australia, and the trend was expected to continue for the next several years. Brazil and South Africa would continue to be major iron ore suppliers to the region. Imports of iron ore by East Asian countries were expected to continue to increase, especially by China to meet its domestic demand. Australia and India are the region's major iron ore suppliers.

Regional production of iron ore was expected to increase at an average annual rate of about 4% between 2004 and 2011. This prediction was based on gradual capacity expansions in Australia, China, and India. Gradual capacity expansions in Australia are planned at the Rio Tinto's Marandoo, Nummuldi, Tom Price, and Yandicoogina mines and the Yandi operations of BHP Billiton Iron Ore Pty. Ltd.; the Mesa J and the West Angeles (Pannawonica) operations of Robe River Iron Associates; and the Jimblebar operation of BHP Iron Ore (Jimblebar) Pty. Ltd. In China, gradual expansion is planned for the following mines: Gaocun and Longqiao in Anhui Province; Heigou in Gansu Province; Mengjiagou, Nanmighe, and Sijiayin in Hebei Province; Hujiamiaozi in Liaoning Province; Shuijigou in the Nei Mongol Autonomous Region; Liguangji in Shandong Province; and Baima and Hongge in Sichuan Province. In India, a large new iron ore mine at Gandhamardan Malanjoli, State of Orissa, was scheduled to start production in 2006 (table 11).

China was the world's leading consumer of iron and steel products. The country's steel products imports had decreased to 35 Mt in 2004 from 45 Mt in 2003. Japan was the world's leading exporter and the region's major supplier of iron and steel products to China and such major consumers in the region as the Republic of Korea, Singapore, Thailand, and Taiwan. Owing to the low steel consumption, the Association of Southeast Asian Nations steel sector remained a group of small steel producing countries in the region.

Regional production of pig iron and direct-reduced iron was expected to increase at an average annual rate of 5% between 2004 and 2011. This prediction was based on the reported capacity expansions mainly from Anshan Iron and Steel Group, Baogang Iron and Steel Group, Shagang Group, Shoudu Iron and Steel Group Co., and Wuhan Iron and Steel Group in China and at Nagamar, State of Chhattisgarh and Jamshedpur, State of Bihar, in India. Pig iron production in Japan, the Republic of Korea, and Taiwan was expected to hold steady between 2004 and 2011 (table 12).

Regional production of crude steel was expected to increase at an average annual rate of about 6% between 2004 and 2011. China was expected to lead in crude steel expansion in the region. Anshan Iron and Steel Group, Baogang Iron and Steel Group, Shagang Group, Shoudu Iron and Steel Group Co., Tangshan Iron and Steel Group, and Wuhan Iron and Steel Group, all of China, planned to expand their steel outputs by about 50% from their current capacities. India is also expected to expand its crude steel capacity significantly. The Indian Government planned to increase crude steel production to about 100 Mt in 2019 from 32 Mt in 2004, which included a 10-Mt/yr greenfield iron and steel plant proposed by BHP Billiton and Pohang Iron and Steel Co. Ltd. of the Republic of Korea in Orissa, expansion projects by Steel Authority of India Ltd. in Bhilai and at the Jamshedpur site, and a 6-Mt/yr greenfield iron and steel plant in Orissa by Tata Steel (table 13).

**Lead and Zinc.**—The region's production of mined lead and zinc accounted for about 55% and 41%, respectively, of the world total in 2004 (table 4). Australia's lead reserves ranked as the world's largest; those of China ranked second.

China ranked as the world's leading producer of mined lead and zinc and accounted for about 31% and 23%, respectively, of the world total in 2004; it was followed by Australia, which accounted for more than 21% and 14%, respectively. India and North Korea were the region's other important producers of mined lead and zinc; their production levels held steady in 2004. China was the world's leading producer of lead and zinc metal and Australia, India, Japan, and the Republic of Korea were the region's other important producers of lead and zinc (table 4).

China was the world's second ranked consumer of primary and secondary lead after the United States in 2004. China consumed more than 1 Mt. The substantial growth in demand for lead during the past several years was owing to the continuing increase in demand for storage batteries by the growing number of automobile producers in China. China also consumed more than 2 Mt of zinc metal. Japan and the Republic of Korea were the region's other important consumers of primary and secondary lead and primary slab zinc; their demands for lead and zinc have remained relatively steady during the past several years.

Regional production of mined lead and zinc was expected to increase at an average annual rate of about 3% and 5%, respectively, between 2004 and 2011. This prediction was based on reported capacity expansions in Australia, China, and India (tables 14, 20). Regional production of zinc metal and primary and secondary refined lead was expected to increase at an average annual rate of about 3%, 4%, and 3 %, respectively, between 2004 and 2011. This prediction was based on gradual capacity expansions mainly in Australia and China (tables 15, 16, 21).

Gradual capacity expansions were expected to be carried out at the Cannington Mine in Queensland by BHP Minerals Ltd. and at the George Fisher and the Hilton Mines at Mount Isa, Queensland, by MIM Holdings Ltd. in Australia. Vedanta Resources planned to expand its lead production at Chanderiya, India.

In China, reported capacity expansions were for a new lead-zinc mine in the Nei Mongol Autonomous Region by Dongshenmiao Lead and Zinc Mining Co.; a new lead-zinc mine at Lanping, Province of Yunnan, by Yunnan Jinding Zinc Co. Ltd.; the lead smelter and refinery at Jiyuan, Province of Henan, by Yuguang Gold and Lead Co. Ltd.; the zinc smelter in the Province of Hunan by Jinshi Mining Co. Ltd.; the zinc smelter and refinery at Chifeng, Nei Mongol Autonomous Region, by a joint venture of Biyinuoer Lead and Zinc Co., Chifeng Hongye Zinc Smelter Co. Ltd., and Kumba Resources Ltd. of South Africa; the lead and zinc smelters and refineries at Baiyin, Province of Gansu, by Baiyin Nonferrous Metals Co. Ltd.; and the lead smelter at Hengyang, Province of Hunan, by Shuikoushan Nonferrous Metals Co. Ltd.

**Nickel.**—The region's production of mined nickel, in terms of metal content, accounted for about 38% of the world total in 2004. Australia ranked first in nickel reserves and was the world's second ranked producer of mined nickel after Russia in 2004. Indonesia and New Caledonia, which were the region's other major producers of mined nickel, accounted for 9% and 8%, respectively, of the world total (table 4).

Japan was the world's leading consumer and importer of nickel ore and nickel matte; more than 4 Mt/yr of nickel ore (gross weight) was imported from Indonesia, New Caledonia, and the Philippines for the production of ferronickel. Japan imported more than 100,000 t/yr of nickel matte from Australia and Indonesia for the production of refined nickel metal and chemicals. The country was the world's second ranked producer after Russia of primary nickel, which included chemicals, ferronickel, nickel oxide sinter, and pure nickel metal. China also was a key regional consumer and importer of nickel ore, matte, and pure metal.

Regional production of mined nickel was expected to continue to increase at an average annual rate of more than 7% between 2004 and 2011. This prediction was based on reported gradual expansions of capacity and increases in productivity (table 17). In Australia, BHP Billiton's Ravensthorpe mine was scheduled to begin operation in mid-2007 and to produce up to 50,000 t/yr of nickel. The concentrate would be shipped to the Yabulu refinery in Townsville for refining. In China, gradual capacity expansion was to be undertaken at Jinchuan, Province of Gansu, by Jinchuan Nonferrous Metals Corp. Baoshan Iron and Steel Group Co. and Yunnan Kunming Co. Ltd. reached an agreement to develop a nickel mine in Yuanjiang County, Province of Yunnan, and to build a 10,000-t/yr nickel refinery by 2008. Construction of a 14,600-t/yr ferronickel plant by PT Aneka Tambang was underway in Indonesia. Sumitomo Metal Mining Co. Ltd. of Japan was constructing a greenfield hydrometallurgical plant to extract nickel from low-grade ores stockpiled at the Rio Tuba Mine on Palawan Island in the Philippines. Inco Limited of Canada began construction of a new large-scale mining and hydrometallurgical nickel-cobalt extraction complex at Goro in New Caledonia; the Goro complex was scheduled to be operational in September 2007. Falconbridge Ltd. was evaluating the Koniambo deposit near Kone in the Northern Province of New Caledonia.

Stainless steel production accounts for about 65% of total world nickel consumption, and the demand for nickel is linked to the development of stainless steel. In the past several years, the demand for stainless steel increased significantly, especially in China. During the past decade, China was a major stainless steel importing country and Japan, the Republic of Korea, and Taiwan supplied about 90% of China's total imports. During the past few years, China's stainless steel imports had declined as the output from Baogang and Taiyuan Iron and Steel Co. increased. China's stainless steel production is expected to grow strongly as several new mills begin operations in the next several years. Nickel consumption in China is expected to increase in the next several years and the nickel consumption in such other countries as Japan, the Republic of Korea, and Taiwan is predicted to decline in the future and will likely offset the increase in China.

**Platinum-Group Metals.**—The region's production of mined palladium and platinum was insignificant and accounted for only 0.7% and 0.3%, respectively, of the world total in 2004 (table 18 and 19). Jinchuan Nonferrous Metals of China produced palladium and platinum as byproducts of mined nickel from its nickel mining and refining operations at Jinchuan, Province of Gansu. Australia was not a primary producer of PGM, although small amounts of palladium were produced from Western Australia's Eastern Goldfield at Kalgoorlie-Boulder and Kambalda as a byproduct of nickel operations.

Regional production of mined platinum was expected to increase at an average annual rate of 4% between 2004 and 2011. This prediction was based on gradual capacity expansion of mined nickel in China (table 18). Regional production of mined palladium was expected to increase at an average annual rate of 2% between 2004 and 2011. This prediction was based on gradual capacity expansion of mined nickel in Australia and China (table 19). Regional PGM consumption was expected to increase in autocatalysts and electronics. The rapid growth in automobiles, light vehicles, computers, and electronic goods in China and India raised the demand for PGM in the region.

## **Industrial Minerals**

**Diamond.**—The region's production of diamond accounted for more than one-quarter of the world total in 2004. In Australia, diamond was produced mainly from Western Australia. The Argyle Mine, which is located in the Ellendale diamond province of the western Kimberley region in Western Australia, was Australia's largest and the world's leading productive diamond mine. Diamond produced from the Argyle Mine by Rio Tinto accounted for about 20% of the world total in 2004. Another diamond mine operated by Rio Tinto was at the Merlin Mine in the Northern Trough in the Northern Territory of Australia.

Regional production of diamond was expected to stay in a narrow range of between 28 million and 31 million carats per year after reaching a peak level of 43 million carats in 2004 (table 22).

**Phosphate Rock.**—The region's production of phosphate rock, in terms of phosphorus pentoxide ( $P_2O_5$ ) content, accounted for about 20% of the world total in 2004. China was the world's third ranked producer of phosphate rock after the United States and Morocco. Other important producers were Australia and India. Most of the region's production of phosphate rock was consumed within the region.

China was the world's leading consumer of phosphate rock. The country's demand for phosphate rock was expected to increase substantially in the next 5 years.

Regional phosphate rock production was expected to increase at an average annual rate of about 1%, which would lead to a shortage in the regional supply because the regional growth in demand for phosphate rock was predicted to grow at a much higher rate than 1% per year during the next 5 to 6 years (table 23).

## Mineral Fuels

**Coal.**—The region's overall production of coal, which included anthracite, bituminous, and lignite, accounted for more than 50% of the world total in 2004. Production of anthracite coal, however, accounted for about 86% of the world total; production of bituminous coal accounted for about 57%; and production of lignite accounted for about 19%. China, which was by far the world's leading producer of anthracite and bituminous coals, accounted for about 70% and 40%, respectively, of the world total. In the Asia and the Pacific region, North Korea and Vietnam were the other significant producers of anthracite coal; Australia, India, and Indonesia were the other important producers of bituminous coal and lignite (table 4).

Japan was the world's leading importer and consumer of coal; virtually all coal requirements for its iron and steel and utility industries was imported. In 2004, the country imported more than 180 Mt of coal, of which 118 Mt was bituminous (steam); 56 Mt, metallurgical-grade bituminous (coking); and 6 Mt, anthracite. Australia ranked as the world's leading coal exporter. The major regional coal exporters (suppliers) were Australia, China, and Indonesia. Mongolia and Vietnam were minor players in the regional exported market.

Regional overall coal production was expected to increase at an average annual rate of about 10% between 2004 and 2011. This prediction was based on capacity expansions at the Hail Creek coking coal deposit in the northern Bowen Basin of central Queensland, Australia, by Rio Tinto; at the Shoushan coal mine in the Province of Henan, China, by Pingabo Coal Co.; at major coal mines in the Province of Shaanxi and the Nei Mongol and the Ningxia Autonomous Regions, China, by Shenhua Coal Corp.; at the Tavan Tolgoi coal project in Mongolia; and at six major coal mines in the Province of Quang Ninh in Vietnam, by Vietnam National Coal Corporation (table 24).

**Natural Gas and Petroleum.**—The Asia and the Pacific region lacks sufficient resources of natural gas and petroleum to meet the rapid regional growth in demand for hydrocarbons. The region's production of natural gas and crude petroleum accounted for about 11% and 10%, respectively, of the world total production in 2004 (table 4). Indonesia was the region's leading producer of natural gas; it was followed by Malaysia, China, and Australia. China was the leading producer of crude petroleum and was followed by Indonesia, Malaysia, and India. Australia, Brunei, Indonesia, and Malaysia were the region's major exporters of natural gas in the form of liquefied natural gas. Brunei, Indonesia, Malaysia, and Vietnam were the major exporters of crude petroleum.

Japan was the world's leading importer and consumer of natural gas and crude petroleum; about 75.2 billion cubic meters of natural gas and 1.5 billion barrels of crude petroleum were imported in 2004. Other important consumers of natural gas and crude petroleum in the region were China, India, the Republic of Korea, Thailand, and Taiwan. Australia, Brunei, Indonesia, and Malaysia were the region's major suppliers of natural gas and crude petroleum to Japan, the Republic of Korea, Singapore, and Taiwan.

Regional production of natural gas was expected to increase at an average annual rate of about 2% between 2004 and 2011. This prediction was based on gradual capacity expansions at Arun, Aceh Special Region, by ExxonMobil Oil Indonesia and offshore East Kalimantan by Total Indonesia and HUFFCO Group in Indonesia; offshore Sarawak, Malaysia, by Sarawak Shell Bhd.; and in the Province of Sichuan, by China National Petroleum Corp. (table 25). China will likely become one of the world's leading importers and consumers of natural gas during the next 5 to 10 years. The Chinese Government projected that demand for natural gas would be 63 billion cubic meters in 2005 and could reach 97 billion cubic meters by 2010.

Regional production of crude petroleum was expected to increase at an average annual rate of less than 2% between 2004 and 2011. This prediction was based on gradual capacity expansions at Mina, Duri, and other major oilfields in central Sumatra by PT Caltex Pacific Indonesia and several major oilfields offshore East Kalimantan in Indonesia; at Liaohe, Province of Liaoning, by Liaohe Bureau; in Bohai by Bohai Offshore Oil Corp.; and offshore Nanhai (South Sea) by Nanhai East Corp. in China (table 26). Because of rapid growth in demand for crude petroleum, China's crude petroleum imports increased by 15% to 69 Mt in 2002 and by 32% to 91 Mt in 2003 and by 34% to 122 Mt in 2004. China overtook Japan as the region's leading importer of crude petroleum in 2004.

**Uranium.**—The region's uranium resources were mainly in Australia, which ranked first in known recoverable resources of uranium in the world and accounted for 28% of the world total. The country, which ranked second after Canada in the production of mined uranium, accounted for 22% of the world total in 2004. In Australia, three active mines were operated, and two more were under development. China was thought to produce about 1,300 t/yr of mined uranium in 2004, and production was expected to increase gradually to 1,500 t/yr by 2011. Most mined uranium was enriched and consumed domestically in China. China planned to add 10 more nuclear powerplants in the coastal area during the next 10 years to relieve the electricity shortage in the area. China's uranium consumption was expected to increase and the country was interested in investing in uranium mines in Australia.

Australia exported nearly all its mined uranium in the form of uranium oxide ( $U_3O_8$ ) to China, Japan, and the Republic of Korea within the region and to France, Spain, Sweden, the United Kingdom, and the United States.

Regional production of mined uranium was expected to increase at an average annual rate of about 2% between 2004 and 2011. This prediction was based mainly on capacity expansions at the Olympic Dam Mine by WMC Resources Ltd. and two in situ leach operations at Beverly by Heathgate Resources Pty. Ltd. and at Honeymoon by Southern Cross Resources Inc. in South Australia (table 27).

## Environment

The Japanese Government amended the Enforcement Order of Industrial Safety and Health Law to prohibit the use of 10 products containing asbestos with more than 1% gravity. The Indonesian Government investigated complaints by the locals that the PT Newmont Minahasa Raya operation in Minahasa polluted Buyat Bay. Water and fish were allegedly contaminated by Newmont's tailing that were disposed of in Buyat Bay. A problem with cadmium contamination was discovered at Padaeng Industry Public Co.



Ltd.'s mine site in the vicinity of Mao Tao Creek in Thailand. A study was undertaken to find sustainable and systematic ways to solve the problem.

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TABLE 1  
ASIA AND THE PACIFIC: AREA AND POPULATION IN 2004

Country	Area <sup>1</sup> total (square kilometers)	Population <sup>2</sup> total (thousands)
Afghanistan	647,500	29,929 <sup>1</sup>
Australia	7,687,850	20,120
Bangladesh	144,000	140,494
Bhutan	47,000	896
Brunei	5,770	361
Burma	678,500	49,910
Cambodia	181,040	13,630
China	9,596,960	1,296,500
Fiji	18,270	848
Hong Kong	1,092	6,845
India	3,287,590	1,079,721
Indonesia	1,919,440	217,588
Japan	377,835	127,764
Korea, North	120,540	22,745
Korea, Republic of	98,480	48,142
Laos	236,800	5,792
Malaysia	329,750	25,209
Mongolia	1,565,000	2,515
Nepal	140,800	25,190
New Caledonia	19,060	229
New Zealand	268,680	4,061
Pakistan	803,940	152,061
Papua New Guinea	462,840	5,625
The Philippines	300,000	82,987
Singapore	692	4,335
Solomon Islands	28,450	471
Sri Lanka	65,610	19,444
Taiwan	35,980	22,894 <sup>1</sup>
Thailand	514,000	62,387
Timor, East	15,007	925
Vietnam	329,560	82,162
Total	29,928,036	3,551,780
World Total	148,940,000	6,345,127

<sup>1</sup>Source: Central Intelligence Agency World Factbook 2005.

<sup>2</sup>Source: World Bank 2005, World Development Indicators Database, September.

TABLE 2  
ASIA AND THE PACIFIC: ECONOMY IN 2004<sup>1,2</sup>

Country	Gross domestic product based on purchasing power parity		Real gross domestic product growth rate (percentage)
	Total (million dollars)	Per capita (dollars)	
Afghanistan	NA	NA	7.5
Australia	602,142	29,893	3.2
Bangladesh	279,793	1,875	5.8
Bhutan	2,638	3,095	7.9
Brunei	8,589	24,143	1.7
Burma	74,104	1,364	5.0
Cambodia	29,245	2,074	7.7
China	7,334,254	5,642	9.5
Fiji	5,078	5,997	4.1
Hong Kong	212,467	30,558	8.1
India	3,290,800	3,080	7.3
Indonesia	801,432	3,702	5.1
Japan	3,817,221	29,906	2.7
Korea, North <sup>3</sup>	30,900	1,400	2.2
Korea, Republic of	1,029,848	21,419	4.6
Laos	11,145	1,921	6.4
Malaysia	265,455	10,423	7.1
Mongolia	4,831	1,918	10.6
Nepal	37,087	1,402	3.4
New Caledonia	NA	NA	NA
New Zealand	97,074	23,944	4.8
Pakistan	360,813	2,388	7.1
Papua New Guinea	13,581	2,357	2.7
The Philippines	383,038	4,561	6.0
Singapore	115,711	26,799	8.4
Solomon Islands	863	1,845	5.5
Sri Lanka	79,020	3,882	5.4
Taiwan	589,534	25,983	5.7
Thailand	512,344	7,901	6.1
Timor, East	NA	NA	1.8
Vietnam	210,937	2,570	7.7
Total	20,199,944	XX	XX
World total	55,654,621	XX	XX

NA Not available. XX Not applicable.

<sup>1</sup>Includes data available as of January 1, 2005. Gross domestic product listed may differ from that reported in individual country chapters owing to differences in source or date of reporting.

<sup>2</sup>Source: International Monetary Fund, World Economic Outlook Database, September 2005.

<sup>3</sup>Source: Central Intelligence Agency World Factbook 2005.

TABLE 3  
ASIA AND THE PACIFIC: SELECTED EXPLORATION SITES IN 2004<sup>1</sup>

Country	Type <sup>2</sup>	Site	Commodity	Company	Resources <sup>3</sup>	Activity <sup>4</sup>
Australia	F	Indee	Au	Range River Gold Ltd.	165,000 oz Au	Feasibility drilling.
Do.	E	Lord Nelson/Lord Henry	Au	Troy Resources NL	319,000 oz Au	Extensive drilling.
Do.	E	Paulsens	Au	Nustar Mining Corp. Ltd.	481,000 oz Au	Do.
Do.	E	Prominent Hill	Cu, Au	Oxiana Ltd.	1.4 Mt Cu, 1.5 Moz Au	Do.
China	E	Boka	Au	Southwestern Resources Corp.	Data not released.	Do.
Do.	F	Jinfeng	Au	Sino Gold Ltd.	2.1 Moz Au	Feasibility drilling.
Do.	E	Maoling	Au	Mundoro Mining Inc.	3 Moz Au	Extensive drilling.
Do.	P	Tanjianshan	Au	Afcan Mining Corp.	1 Moz Au	Do.
Indonesia	P	Grasberg/Deep MLZ	Cu, Au	Freeport-McMoRan Copper & Gold Inc.	1.8 Mt Cu, 4.4 Moz Au	Do.
Malaysia	P	Penjom	Au	Avocet Mining plc	473,000 oz Au	Do.
Mongolia	E	Turquoise Hill/Hugo North	Cu, Au	Ivanhoe Mines Ltd.	4.98 Mt Cu, 12.3 Moz Au	Do.
New Zealand	P	Macraes/Frasers	Au	Oceana Gold Ltd.	Data not released.	Do.
Pakistan	F	Reko Diq/H4	Cu, Au	Tethyan Copper Company Ltd.	884,100 t Cu	Feasibility drilling.
Vietnam	F	Ban Phuc	Ni, Cu, Co	Asian Mineral Resources Ltd.	64,600 t Ni, 10,200 t Cu	Do.

<sup>1</sup>Abbreviations used for commodities in this table include the following: Au--gold; Co--Cobalt; Cu--copper; Ni--nickel.

Abbreviations used for units of measure include the following: Moz--million troy ounces; Mt--million metric tons; oz--troy ounces; t--metric tons.

<sup>2</sup>E-Active exploration; F-Feasibility work ongoing/completed; P-Exploration at producing site.

<sup>3</sup>Resources reported where available based on data from various sources and reflect unverified public information reported by trade journals.

<sup>4</sup>Sites where extensive (greater than 10,000 meters) drilling or significant (more than \$5 million) expenditure have been reported.

TABLE 4  
ASIA AND THE PACIFIC: PRODUCTION OF SELECTED COMMODITIES IN 2004<sup>1</sup>

(Thousand metric tons unless otherwise specified)

Country	Metals										
	Aluminum			Copper		Gold, mine output, Au content (kilograms)	Iron and steel			Lead	
	Alumina	Bauxite	Metal <sup>2</sup>	Mine output, Cu content	Refined, primary		Ore, gross weight	Pig	Steel, crude	Mine output, Pb content	Refined, primary
Afghanistan	--	--	--	5 <sup>e</sup>	--	--	--	--	--	--	--
Australia	16,525	43,993	2,027	656	383	259,000	230,955	9,700 <sup>e</sup>	8,411	678	266
Bangladesh	--	--	--	--	--	--	--	--	25 <sup>e</sup>	--	--
Bhutan	--	--	--	--	--	--	--	--	--	--	--
Brunei <sup>3</sup>	--	--	--	--	--	--	--	--	--	--	--
Burma	--	--	--	32	32	100 <sup>e</sup>	--	2 <sup>e</sup>	25 <sup>e</sup>	1 <sup>e</sup>	(4)
Cambodia	--	--	--	--	--	--	--	--	--	--	--
China <sup>c</sup>	6,990	15,000	6,900	610	1,630	215,000	310,000	251,850 <sup>5</sup>	272,800 <sup>5</sup>	950	1,500
Christmas Island	--	--	--	--	--	--	--	--	--	--	--
Fiji	--	--	--	--	--	3,800 <sup>e</sup>	--	--	--	--	--
Hong Kong <sup>3</sup>	--	--	--	--	--	--	--	--	--	--	--
India <sup>c</sup>	2,600	11,275 <sup>5</sup>	862 <sup>5</sup>	29 <sup>5</sup>	377	-- <sup>5</sup>	126,000 <sup>5</sup>	25,000	32,000	40 <sup>5</sup>	42 <sup>5</sup>
Indonesia	--	1,331	230 <sup>e</sup>	840	211	92,936	--	1,470	2,800 <sup>e</sup>	--	--
Japan	340 <sup>e</sup>	--	1,076	--	1,188	8,021	--	82,974	112,718	6	94
Korea, North <sup>c</sup>	--	--	--	12	15	6,000	4,580	900	1,070	20	7
Korea, Republic of	--	--	--	--	496	233	496	27,556	47,521	(4)	174
Laos	--	--	--	--	--	4,400 <sup>e</sup>	--	--	--	--	--
Malaysia	--	2	--	--	--	4,221	664	--	4,200 <sup>e</sup>	--	--
Mongolia	--	--	--	130	2	18,600	--	--	40 <sup>e</sup>	--	--
Nauru	--	--	--	--	--	--	--	--	--	--	--
Nepal	--	--	--	--	--	--	--	--	--	--	--
New Caledonia	--	--	--	--	--	--	--	--	--	--	--
New Zealand	--	--	372	--	--	10,151	--	650 <sup>e</sup>	850 <sup>e</sup>	--	--
Pakistan	--	5	--	--	--	--	86	1,700 <sup>e</sup>	600 <sup>e</sup>	--	--
Papua New Guinea	--	--	--	177	--	67,000 <sup>e</sup>	--	--	--	--	--
Philippines	--	--	--	16	175	35,464	--	--	550 <sup>e</sup>	--	--
Singapore	--	--	--	--	--	--	--	--	--	--	--
Solomon Islands	--	--	--	--	--	--	--	--	--	--	--
Sri Lanka	--	--	--	--	--	--	--	--	--	--	--
Taiwan	--	--	--	--	--	--	--	10,198	19,604	--	--
Thailand	--	--	--	--	18	4,500	136	--	4,533	--	2
Vietnam <sup>c</sup>	--	--	--	--	--	2,000	650	--	658 <sup>5</sup>	1	--
Total	26,500	71,600	11,500	2,510	4,530	731,000	674,000	412,000	508,000	1,700	2,090
Share of 2004 world total	44.4%	48.7%	32.6%	17.5%	31.4%	30.0%	49.8%	57.5%	48.7%	54.9%	61.7%
Share of 2003 world total	44.6%	52.3%	31.7%	20.9%	32.2%	30.6%	46.5%	55.5%	46.5%	53.2%	60.0%
United States	5,350	NA	2,520	1,160	1,260	258,000	54,700	42,300	99,700	445	148
World total	59,600	147,000	35,100	14,300	14,400	2,430,000	1,350,000	717,000	1,040,000	3,090	3,380

See footnotes at end of table.

TABLE 4--Continued  
ASIA AND THE PACIFIC: PRODUCTION OF SELECTED COMMODITIES IN 2004<sup>1</sup>

(Thousand metric tons unless otherwise specified)

Country	Metals								
	Manganese ore, mine output, Mn content	Mercury, mine output, Hg content (metric tons)	Nickel		Tin, metric tons		Tungsten, mine output, W content (metric tons)	Zinc, metric tons	
			Mine output, Ni content	Refined	Mine output, Sn content	Metal, primary		Mine output, Zn content	Metal <sup>2</sup>
Afghanistan	--	--	--	--	--	--	--	--	--
Australia	1,327	--	178	185	1,306	467	--	1,334,000	477,500
Bangladesh	--	--	--	--	--	--	--	--	--
Bhutan	--	--	--	--	--	--	--	--	--
Brunei <sup>3</sup>	--	--	--	--	--	--	--	--	--
Burma	(4)	--	(4)	--	526	30 <sup>e</sup>	107	196	--
Cambodia	--	--	--	--	--	--	--	--	--
China <sup>c</sup>	900	425	64	72	110,000	115,000	67,000	2,100,000	2,500,000
Christmas Island	--	--	--	--	--	--	--	--	--
Fiji	--	--	--	--	--	--	--	--	--
Hong Kong <sup>3</sup>	--	--	--	--	--	--	--	--	--
India <sup>c</sup>	630	--	--	--	--	--	--	184,000	262,400 <sup>5</sup>
Indonesia	--	--	133	--	65,772	49,872	--	--	--
Japan	--	--	--	33	--	707	--	47,781	667,247
Korea, North <sup>c</sup>	--	--	--	--	--	--	600	62,000	67,000
Korea, Republic of	--	--	--	27	--	--	--	14	668,666
Laos	--	--	--	--	340 <sup>e</sup>	--	--	300 <sup>e</sup>	--
Malaysia	--	--	--	--	2,745	33,914	--	--	--
Mongolia	--	--	--	--	--	--	40 <sup>e</sup>	--	--
Nauru	--	--	--	--	--	--	--	--	--
Nepal	--	--	--	--	--	--	--	--	--
New Caledonia	--	--	118 <sup>p</sup>	--	--	--	--	--	--
New Zealand	--	--	--	--	--	--	--	--	--
Pakistan	--	--	--	--	--	--	--	--	--
Papua New Guinea	--	--	--	--	--	--	--	--	--
Philippines	--	--	17	--	--	--	--	--	--
Singapore	--	--	--	--	--	--	--	--	--
Solomon Islands	--	--	--	--	--	--	--	--	--
Sri Lanka	--	--	--	--	--	--	--	--	--
Taiwan	--	--	--	11 <sup>e</sup>	--	--	--	--	--
Thailand	2	--	--	--	586	20,800	180 <sup>e</sup>	43,400 <sup>e</sup>	68,300
Vietnam <sup>c</sup>	--	--	--	--	3,500	3,500	--	40,000	--
Total	2,860	425	510	328	185,000	224,000	67,900	3,810,000	4,710,000
Share of 2004 world total	29.4%	26.0%	35.5%	34.3%	63.3%	73.8%	91.4%	41.7%	46.4%
Share of 2003 world total	31.2%	26.0%	36.7%	37.1%	71.2%	72.9%	84.1%	40.9%	46.8%
United States	--	NA	--	--	--	--	--	739,000	305,000
World total	9,720	1,630	1,440	957	292,000	304,000	74,300	9,140,000	10,200,000

See footnotes at end of table.

TABLE 4--Continued  
ASIA AND THE PACIFIC: PRODUCTION OF SELECTED COMMODITIES IN 2004<sup>1</sup>

(Thousand metric tons unless otherwise specified)

Country	Industrial minerals						Mineral fuels			Petroleum, crude (thousand 42-gallon barrels)
	Cement, hydraulic	Fluorspar (metric tons)	Graphite (metric tons)	Magnesite	Mica (metric tons)	Salt	Coal		Natural gas, dry (million cubic meters)	
							Anthracite	Bituminous		
Afghanistan	120 <sup>e</sup>	--	--	--	--	13 <sup>e</sup>	--	185 <sup>e</sup>	2,500 <sup>e</sup>	--
Australia	8,000 <sup>e</sup>	--	--	474	--	11,221	--	257,790	30,000 <sup>e</sup>	250,000 <sup>e</sup>
Bangladesh	5,000 <sup>e</sup>	--	--	--	--	350	--	--	7,100 <sup>e</sup>	1,700 <sup>e</sup>
Bhutan	170 <sup>e</sup>	--	--	--	--	--	--	67 <sup>e</sup>	--	--
Brunei <sup>3</sup>	242	--	--	--	--	--	--	--	11,500 <sup>e</sup>	70,000 <sup>e</sup>
Burma	519	--	--	--	--	35 <sup>e</sup>	--	--	10,277	7,160
Cambodia	--	--	--	--	--	40 <sup>e</sup>	--	--	--	--
China <sup>c</sup>	970,000 <sup>5</sup>	2,700,000	700,000	4,650	--	37,100 <sup>5</sup>	220,000	1,690,000	34,000	1,300,000
Christmas Island	--	--	--	--	--	--	--	--	--	--
Fiji	100 <sup>e</sup>	--	--	--	--	--	--	--	--	--
Hong Kong <sup>3</sup>	1,039	--	--	--	--	--	--	--	--	--
India <sup>c</sup>	125,000	10,700	120,000	370	3,700	15,003 <sup>5</sup>	--	330,000	26,000	244,000
Indonesia	36,000 <sup>e</sup>	--	--	--	--	680 <sup>e</sup>	50 <sup>e</sup>	132,000 <sup>e</sup>	52,000 <sup>e</sup>	362,000
Japan	67,376	--	--	--	--	1,225	--	1,339	3,021	5,250
Korea, North <sup>c</sup>	5,630	12,000	25,000	1,200	--	500	16,300	--	--	--
Korea, Republic of	54,330	--	247	--	59,238	800 <sup>e</sup>	3,248	--	--	--
Laos	250 <sup>e</sup>	--	--	--	--	15 <sup>e</sup>	--	220 <sup>e</sup>	--	--
Malaysia	22,833	--	--	--	3,544	--	--	389	53,688	279,000
Mongolia	170 <sup>e</sup>	295,000	--	--	--	2 <sup>e</sup>	--	197	--	190
Nauru	--	--	--	--	--	--	--	--	--	--
Nepal	300 <sup>e</sup>	--	--	--	--	4	--	10	--	--
New Caledonia	100 <sup>p</sup>	--	--	--	--	--	--	--	--	--
New Zealand	1,000 <sup>e</sup>	--	--	--	--	70 <sup>e</sup>	720	4,152	5,000 <sup>e</sup>	8,710
Pakistan	10,400 <sup>e</sup>	1,026	--	5	--	1,606	--	3,275	29,773	22,600
Papua New Guinea	--	--	--	--	--	--	--	--	1,450	20,000
Philippines	8,500 <sup>e</sup>	--	--	--	--	430 <sup>e</sup>	--	1,996	--	2,000 <sup>e</sup>
Singapore	--	--	--	--	--	--	--	--	--	--
Solomon Islands	--	--	--	--	--	--	--	--	--	--
Sri Lanka	1,400 <sup>e</sup>	--	3,400 <sup>e</sup>	--	1,700 <sup>e</sup>	79 <sup>e</sup>	--	--	--	--
Taiwan	19,050	--	--	--	2,973	--	--	--	720 <sup>e</sup>	280
Thailand	35,626	2,375	--	--	--	1,131	--	--	22,366	56,200
Vietnam <sup>e</sup>	25,320 <sup>5</sup>	3,000	--	--	--	1,300	26,820 <sup>5</sup>	--	6,250 <sup>5</sup>	143,000 <sup>5</sup>
Total	1,400,000	3,020,000	849,000	6,700	71,200	71,600	267,000	2,420,000	296,000	2,770,000
Share of 2004 world total	64.9%	57.1%	86.3%	47.6%	21.8%	31.3%	85.5%	57.1%	10.8%	10.2%
Share of 2003 world total	63.9%	58.7%	87.2%	49.3%	16.5%	31.0%	86.1%	54.9%	10.4%	10.4%
United States	99,000	--	--	W	99,200	46,500	1,550	932,000	531,000	1,980,000
World total	2,150,000	5,300,000	983,000	14,100	326,000	228,000	312,000	4,240,000	2,750,000	27,200,000

See footnotes at end of table.

TABLE 4--Continued  
ASIA AND THE PACIFIC: PRODUCTION OF SELECTED COMMODITIES IN 2004<sup>1</sup>

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<sup>6</sup>Estimated; estimated data, U.S. data, and world totals are rounded to no more than three significant digits. <sup>P</sup>Preliminary. NA Not available. W Withheld to avoid disclosing company proprietary data; not included in world total. -- Zero or zero percent.

<sup>1</sup>Totals may not add due to independent rounding. Percentages are calculated on unrounded data. Table includes data available as of March 31, 2006.

<sup>2</sup>Primary and secondary production.

<sup>3</sup>Not in Minerals Yearbook, volume III.

<sup>4</sup>Less than 1/2 unit.

<sup>5</sup>Reported figure.



TABLE 5  
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED BAUXITE MINE PRODUCTION, 1990-2011<sup>1</sup>

(Thousand metric tons, gross weight)

Country	1990	1995	2000	2004	2007 <sup>c</sup>	2009 <sup>c</sup>	2011 <sup>c</sup>
Australia	41,400	42,700	53,800	43,993	57,000	60,000	63,000
China	2,400	5,000	9,000	15,000	20,000	22,000	25,000
India	4,850	5,240	7,560	11,275	14,000	16,000	18,000
Indonesia	1,210	899	1,150	1,331	1,700	1,900	2,100
Malaysia	398	184	123	2	--	--	--
Other	3	3	9	5	25	25	1,700
Total	50,300	54,000	72,000	72,000	93,000	100,000	110,000

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. -- Negligible or no production.

<sup>1</sup>Totals are rounded.

TABLE 6  
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED PRIMARY ALUMINUM METAL PRODUCTION, 1990-2011<sup>1</sup>

(Thousand metric tons)

Country	1990	1995	2000	2004	2007 <sup>c</sup>	2009 <sup>c</sup>	2011 <sup>c</sup>
Australia	1,230	1,300	1,770	1,900	2,200	2,500	3,500
China	847	1,750	2,800	6,700	9,400	10,000	10,000
India	433	537	644	862	890	910	930
Indonesia	186	220	160	230	240	250	250
New Zealand	260	273	328	372	350	350	450
Other	34	18	7	6	410	610	710
Total	2,990	4,100	5,700	10,100	13,500	15,000	16,000

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>1</sup>Totals are rounded.

TABLE 7

ASIA AND THE PACIFIC: HISTORIC AND PROJECTED SECONDARY ALUMINUM METAL PRODUCTION, 1990-2011<sup>1</sup>

(Thousand metric tons)

Country	1990	1995	2000	2004	2007 <sup>c</sup>	2009 <sup>c</sup>	2011 <sup>c</sup>
China	7	12	175	200	350	400	600
Japan	1,100	1,200	1,210	1,015	1,000	1,000	1,000
Total	1,100	1,200	1,390	1,200	1,350	1,400	1,600

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown.<sup>1</sup>Totals are rounded.

TABLE 8  
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED COPPER MINE PRODUCTION, 1990-2011<sup>1</sup>

(Metal content in thousand metric tons)

Country	1990	1995	2000	2004	2007 <sup>c</sup>	2009 <sup>c</sup>	2011 <sup>c</sup>
Australia	327	398	829	656	910	1,000	1,200
China	285	445	593	610	650	660	700
India	58	47	32	29	28	26	26
Indonesia	164	444	1,010	840	1,250	1,260	1,300
Mongolia	124	122	125	130	180	250	300
Papua New Guinea	170	213	203	177	210	200	200
Philippines	182	108	130	159	160	160	160
Other	25	26	44	49	160	280	380
Total	1,340	1,800	2,970	2,650	3,600	3,800	4,300

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>1</sup>Totals are rounded.

TABLE 9  
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED REFINED COPPER METAL PRODUCTION, 1990-2011<sup>1</sup>

(Thousand metric tons)

Country	1990	1995	2000	2004	2007 <sup>c</sup>	2009 <sup>c</sup>	2011 <sup>c</sup>
Australia	274	248	488	383	650	700	800
China	560	1,080	1,370	2,150	3,000	3,300	3,600
India	42	40	243	377	400	440	480
Indonesia	--	--	158	211	240	240	300
Japan	1,010	1,190	1,440	1,380	1,400	1,600	1,600
Korea, Republic of	186	235	468	496	530	530	530
Other	161	187	195	244	400	450	550
Total	2,230	2,980	4,360	5,240	6,600	7,300	7,900

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. -- Negligible or no production.

<sup>1</sup>Totals are rounded.

TABLE 10  
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED GOLD MINE PRODUCTION, 1990-2011<sup>1</sup>

(Metal content in kilograms)

Country	1990	1995	2000	2004	2007 <sup>c</sup>	2009 <sup>c</sup>	2011 <sup>c</sup>
Australia	244,000	254,000	269,000	259,000	270,000	300,000	350,000
China	100,000	140,000	180,000	215,000	230,000	250,000	260,000
Indonesia	11,200	64,000	125,000	92,936	195,000	200,000	210,000
Japan	7,300	9,190	8,400	8,021	8,200	8,200	8,200
Korea, North	5,000	5,000	6,600	6,000	6,000	6,000	6,000
Mongolia	1,000	4,500	11,800	18,600	26,000	30,000	33,000
New Zealand	4,630	12,100	9,880	10,151	11,000	12,000	13,000
Papua New Guinea	31,900	51,700	74,500	67,000	72,000	74,000	80,000
Philippines	24,600	27,000	36,500	35,464	36,000	38,000	48,000
Other	9,940	9,330	17,400	23,054	28,900	31,100	30,300
Total	439,000	577,000	739,000	735,000	880,000	950,000	1,000,000

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>1</sup>Totals are rounded.

TABLE 11  
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED BENEFICIATED IRON ORE PRODUCTION, 1990-2011<sup>1</sup>

(Metal content in thousand metric tons)

Country	Average ore grade (% Fe)	1990	1995	2000	2004	2007 <sup>c</sup>	2009 <sup>c</sup>	2011 <sup>c</sup>
Australia	62	69,800	88,700	107,000	144,000	147,000	160,000	175,000
China	64	55,000	82,300	73,600	102,000	120,000	130,000	140,000
India	64	34,400	41,700	48,600	80,600	90,000	92,000	93,000
Korea, North	NA	4,700	2,000	1,100	1,300	1,500	1,500	5,000
Other		1,160	1,240	1,480	1,630	2,000	1,980	1,980
Total		165,000	216,000	232,000	330,000	360,000	390,000	420,000

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. NA Not available.

<sup>1</sup>Totals are rounded.

TABLE 12  
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED DIRECT-REDUCED IRON AND PIG IRON PRODUCTION, 1990-2011<sup>1</sup>

(Thousand metric tons)

Country	1990	1995	2000	2004	2007 <sup>c</sup>	2009 <sup>c</sup>	2011 <sup>c</sup>
Australia	6,130	7,860	6,110	9,700	10,000	10,000	11,000
China	62,400	105,000	131,000	251,850	360,000	400,000	420,000
India	13,400	22,900	26,800	30,800	32,000	33,000	33,000
Japan	80,200	74,900	81,070	82,974	82,000	82,000	82,000
Korea, Republic of	15,300	22,300	24,900	27,556	28,000	30,000	30,000
Taiwan	5,470	6,060	9,970	10,198	11,000	11,500	12,000
Other	8,650	3,410	5,960	6,402	7,400	8,800	9,400
Total	192,000	242,000	286,000	419,000	530,000	580,000	600,000

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>1</sup>Totals are rounded.



TABLE 13  
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED CRUDE STEEL PRODUCTION, 1990-2011<sup>1</sup>

(Thousand metric tons)

Country	1990	1995	2000	2004	2007 <sup>c</sup>	2009 <sup>c</sup>	2011 <sup>c</sup>
Australia	6,670	8,450	7,300	8,411	10,000	10,000	20,000
China	66,100	95,400	129,000	272,800	400,000	460,000	510,000
India	15,000	22,800	26,900	32,000	34,000	36,000	38,000
Japan	110,000	102,000	106,400	112,718	113,000	113,000	113,000
Korea, Republic of	23,100	36,800	43,100	47,521	49,000	51,000	51,000
Malaysia	1,200	2,450	2,430	4,200	4,500	5,000	5,200
Taiwan	9,750	11,600	17,300	19,604	19,500	20,000	20,000
Thailand	685	2,134	2,100	4,533	4,500	5,000	6,000
Other	13,400	14,900	6,030	6,618	7,300	8,050	9,500
Total	246,000	297,000	341,000	508,000	640,000	710,000	770,000

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>1</sup>Totals are rounded.

TABLE 14  
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED LEAD MINE PRODUCTION, 1990-2011<sup>1</sup>

(Metal content in metric tons)

Country	1990	1995	2000	2004	2007 <sup>c</sup>	2009 <sup>c</sup>	2011 <sup>c</sup>
Australia	570,000	455,000	739,000	678,000	716,000	718,000	720,000
China	315,000	520,000	660,000	950,000	1,000,000	1,100,000	1,200,000
India	23,200	34,000	28,900	39,800	42,000	44,000	45,000
Japan	18,700	9,660	8,840	5,500	--	--	--
Korea, North	80,000	75,000	9,000	20,000	20,000	20,000	20,000
Vietnam	--	1,000	1,000	1,000	1,000	1,000	1,000
Other	24,900	12,080	16,800	500	2,500	2,500	2,500
Total	1,030,000	1,110,000	1,460,000	1,690,000	1,800,000	1,900,000	2,000,000

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. -- Negligible or no production.

<sup>1</sup>Totals are rounded.

TABLE 15  
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED PRIMARY REFINED LEAD PRODUCTION, 1990-2011<sup>1</sup>

(Thousand metric tons)

Country	1990	1995	2000	2004	2007 <sup>c</sup>	2009 <sup>c</sup>	2011 <sup>c</sup>
Australia	212	215	223	266	240	250	266
China	260	458	998	1,500	1,800	2,000	2,200
India	29	62	57	42	50	55	60
Japan	205	148	130	94	95	95	95
Korea, North	70	65	7	7	7	7	7
Korea, Republic of	61	130	171	174	175	175	175
Other	2	10	4	2	2	2	2
Total	839	1,090	1,590	2,090	2,400	2,600	2,800

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>1</sup>Totals are rounded.

TABLE 16  
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED SECONDARY REFINED LEAD PRODUCTION, 1990-2011<sup>1</sup>

(Thousand metric tons)

Country	1990	1995	2000	2004	2007 <sup>c</sup>	2009 <sup>c</sup>	2011 <sup>c</sup>
Australia	17	26	28	34	40	40	40
China	36	150	102	350	400	450	500
India	17	28	21	25	28	30	30
Japan	122	140	182	189	195	200	200
Malaysia	16	34	35	40	42	42	42
Philippines	12	17	16	25	26	27	27
Thailand	16	11	24	28	28	28	28
Other	16	25	12	23	23	23	23
Total	252	431	420	714	780	840	890

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>1</sup>Totals are rounded.

TABLE 17  
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED NICKEL MINE PRODUCTION, 1990-2011<sup>1</sup>

(Metal content in metric tons)

Country	1990	1995	2000	2004	2007 <sup>c</sup>	2009 <sup>c</sup>	2011 <sup>c</sup>
Australia	67,800	103,000	167,000	178,000	230,000	250,000	350,000
China	33,000	41,800	50,300	64,000	66,000	67,000	70,000
Indonesia	68,300	88,200	98,200	133,000	160,000	180,000	180,000
New Caledonia	85,100	120,000	126,000	118,300	125,000	150,000	160,000
Philippines	15,800	15,100	17,400	17,000	30,000	32,000	3,500
Total	270,000	368,000	459,000	510,000	610,000	680,000	760,000

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>1</sup>Totals are rounded.

TABLE 18  
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED PLATINUM MINE PRODUCTION, 1990-2011<sup>1</sup>

(Metal content in kilograms)

Country	1990	1995	2000	2004	2007 <sup>c</sup>	2009 <sup>c</sup>	2011 <sup>c</sup>
Australia	100	100	171	200	230	230	300
China	260	300	650	800	850	900	1,000
Total	360	400	820	1,000	1,100	1,100	1,300

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>1</sup>Totals are rounded.

TABLE 19  
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED PALLADIUM MINE PRODUCTION, 1990-2011<sup>1</sup>

(Metal content in kilograms)

Country	1990	1995	2000	2004	2007 <sup>c</sup>	2009 <sup>c</sup>	2011 <sup>c</sup>
Australia	400	400	812	800	950	1,000	1,000
China	130	170	350	450	500	550	650
Total	500	600	1,160	1,300	1,450	1,550	1,650

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>1</sup>Totals are rounded.

TABLE 20  
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED ZINC MINE PRODUCTION, 1990-2011<sup>1</sup>

(Metal content in thousand metric tons)

Country	1990	1995	2000	2004	2007 <sup>c</sup>	2009 <sup>c</sup>	2011 <sup>c</sup>
Australia	933	937	1,420	1,334	1,600	1,800	2,500
China	619	1,010	1,780	2,100	2,300	2,500	2,600
India	74	155	144	184	190	195	200
Japan	127	95	64	48	--	--	--
Korea, North	230	150	60	62	65	70	70
Thailand	11	23	27	43	40	40	40
Vietnam	10	14	13	40	40	50	50
Other	2	1	--	1	62	62	63
Total	2,010	2,390	3,510	3,810	4,300	4,700	5,500

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>1</sup>Totals are rounded.



TABLE 21  
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED ZINC METAL PRODUCTION, 1990-2011<sup>1</sup>

(Thousand metric tons)

Country	1990	1995	2000	2004	2007 <sup>c</sup>	2009 <sup>c</sup>	2011 <sup>c</sup>
Australia	303	320	490	478	600	700	800
China	550	1,080	1,980	2,500	2,600	2,800	3,000
India	79	171	201	262	280	290	300
Japan	732	711	699	667	700	700	700
Korea, North	200	150	65	67	67	70	100
Korea, Republic of	248	279	474	669	680	700	700
Thailand	63	56	101	115	120	120	120
Total	2,180	2,770	4,010	4,760	5,100	5,400	5,700

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>1</sup>Totals are rounded.

TABLE 22  
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED DIAMOND PRODUCTION, 1990-2011<sup>1</sup>

(Thousand carats)

Country (average % gem grade)	1990	1995	2000	2004	2007 <sup>e</sup>	2009 <sup>e</sup>	2011 <sup>e</sup>
Australia	34,600	40,700	26,600	43,311	28,000	30,000	30,000
China	1,000	1,130	1,150	100	100	100	100
India	15	21	16	16	18	19	20
Indonesia	23	22	23	23	23	23	30
Total	35,600	41,900	27,800	43,500	28,000	30,000	30,000

<sup>e</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>1</sup>Totals are rounded.

TABLE 23  
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED PHOSPHATE ROCK PRODUCTION, 1990-2011<sup>1</sup>

(P<sub>2</sub>O<sub>5</sub> content in thousand metric tons)

Country		1995	2000	2004	2007 <sup>c</sup>	2009 <sup>c</sup>	2011 <sup>c</sup>
Australia	--	1	225	220	550	600	650
China	6,400	7,960	5,820	7,560	7,700	7,800	7,800
India	181	360	336	338	340	340	340
Philippines	3	8	109	110	115	120	125
Vietnam	96	178	236	240	240	250	250
Other	526	509	508	355	240	190	170
Total	7,210	9,020	7,010	8,600	8,600	8,700	9,300

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. -- Negligible or no production.

<sup>1</sup>Totals are rounded.

TABLE 24  
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED SALABLE COAL PRODUCTION, 1990-2011<sup>1</sup>

(Thousand metric tons)

Country	1990	1995	2000	2004	2007 <sup>e</sup>	2009 <sup>e</sup>	2011 <sup>e</sup>
Australia	199,000	194,000	313,000	225,000	352,000	355,000	456,000
China	1,010,000	1,310,000	957,000	1,960,000	2,250,000	2,400,000	2,600,000
India	226,000	290,000	335,000	355,000	370,000	380,000	390,000
Indonesia	10,000	40,000	77,200	137,000	160,000	170,000	180,000
Japan	7,980	6,260	3,130	1,339	--	--	--
Korea, North	68,000	70,000	22,500	22,800	26,000	26,000	26,000
Korea, Republic of	17,200	5,720	4,170	3,248	3,400	3,400	3,400
Mongolia	7,160	5,019	5,185	6,800	8,000	10,000	12,000
New Zealand	2,580	3,445	3,586	4,872	5,600	5,600	5,700
Pakistan	2,730	2,997	3,116	3,275	3,370	3,400	3,440
Philippines	1,190	1,200	1,300	1,996	1,700	1,700	1,800
Thailand	14,200	18,400	17,786	20,060	21,000	22,000	23,000
Vietnam	4,020	8,350	11,600	26,820	28,000	30,000	40,000
Other	320	517	837	1,110	1,120	1,130	1,120
Total	1,570,000	1,960,000	1,760,000	2,770,000	3,200,000	3,400,000	3,700,000

<sup>e</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. -- Negligible or no production.

<sup>1</sup>Totals are rounded.

TABLE 25  
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED NATURAL GAS PRODUCTION, 1990-2011<sup>1</sup>

(Million cubic meters)

Country	1990	1995	2000	2004	2007 <sup>c</sup>	2009 <sup>c</sup>	2011 <sup>c</sup>
Australia	20,700	29,700	30,800	30,000	32,000	40,000	40,000
Brunei	9,450	11,200	10,800	11,500	12,000	12,000	13,000
Burma	993	1,477	8,477	10,277	10,500	10,500	10,500
China	15,000	18,000	22,000	41,000	44,000	46,000	48,000
India	10,200	17,800	30,000	28,000	26,000	25,000	25,000
Indonesia	61,000	85,100	82,300	83,740	92,000	94,000	95,000
Malaysia	18,500	36,500	56,900	67,530	70,000	70,000	70,000
Pakistan	14,150	16,839	24,222	25,000	26,000	26,000	30,000
Thailand	7,210	11,400	20,200	22,366	23,000	25,000	26,000
Other	15,170	17,310	19,990	25,880	26,300	26,900	27,300
Total	172,000	245,000	306,000	345,000	360,000	375,000	390,000

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>1</sup>Totals are rounded.

TABLE 26  
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED CRUDE PETROLEUM PRODUCTION, 1990-2011<sup>1</sup>

(Million 42-gallon barrels)

Country	1990	1995	2000	2004	2007 <sup>c</sup>	2009 <sup>c</sup>	2011 <sup>c</sup>
Australia	211	185	264	250	230	240	240
China	1,010	1,100	1,200	1,300	1,400	1,400	1,450
India	250	258	238	244	246	247	248
Indonesia	534	580	516	362	420	450	450
Malaysia	227	257	249	279	260	260	260
Vietnam	20	64	115	143	145	150	160
Other	104	154	160	170	171	171	175
Total	2,360	2,600	2,700	2,800	2,900	2,900	3,000

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>1</sup>Totals are rounded.

TABLE 27  
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED URANIUM MINE PRODUCTION, 1990-2011<sup>1</sup>

(Metal content in metric tons)

Country	1990	1995	2000	2004	2007 <sup>c</sup>	2009 <sup>c</sup>	2011 <sup>c</sup>
Australia	3,530	3,700	7,580	8,910	9,000	9,100	9,200
China	100	500	1,000	1,300	1,500	1,500	1,500
Total	3,600	4,200	9,000	10,200	10,500	10,600	10,700

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>1</sup>Totals are rounded.